

REMARKS

This paper is submitted in response to the Office Action mailed October 8, 2003.

Claims 1-17 were rejected. Claims 18-34 were subject to restriction and have been withdrawn from further consideration. Claim 1 has been amended and now incorporates the limitations of Claims 2, 3, and 4, which have been canceled. Claims 5, 10, 15, 16, and 17 have been amended, and Claims 35-55 have been added, for greater clarity in describing the invention under 35 U.S.C. § 112. Reconsideration and further examination of the application are requested.

In the Office Action, the Examiner rejected Claims 1-17 as being anticipated by any one of U.S. Patent No. 6,462,818 to Bareket ("Bareket"), U.S. Patent No. 6,022,650 to Sogawa ("Sogawa"), U.S. Patent No. 5,853,927 to Huang ("Huang"), U.S. Patent No. 5,849,441 to Nara et al. ("Nara"), or U.S. Patent No. 5,721,619 to Hiruma et al. ("Hiruma"). In making the rejections the Examiner did not cite to any particular passages from the cited patents but did request that the Applicant specifically review the drawings and the claims in the patents. Applicants respectfully submit that these rejections are traversed. Reconsideration of the rejection and continued examination of the application, as amended, are requested.

The Examiner asserted that any one of Barket, Sogawa, Huang, Nara, or Hiruma describe "reticles for use in lithographic projection exposure comprising an alignment pattern with known deviations from the pattern encoded on the reticle." Applicants assert that such is not the case with respect to the independent claims in the application. For example, Claim 1, as amended, reads as follows:

1. (currently amended) A reticle for use in a photolithographic projection system, the reticle comprising a pattern of alignment attributes with known deviations in the pattern encoded onto the reticle wherein the known deviations are imaged in predetermined locations on an exposed recording media and appear in a predetermined order when the projection system is operated in accordance with a properly ordered job deck, the deviations include placement errors in the pattern of alignment attributes, wherein the placement errors include a removed portion of an attribute, located at the same position of the pattern of alignment attributes, inside each field point array.

As a result of these characteristics, a reticle constructed in accordance with the claimed invention will have deviations that appear in a predetermined order when the projection system is operated in accordance with a properly ordered job deck, and will determine if the job deck is in a proper order.

Applicants assert that neither Bareket, Sogawa, Huang, Nara nor Hiruma individually, or in combination, show the elements recited in Claim 1. Independent Claim 35 contains similar limitations, and independent Claim 43 similarly recites a "reticle comprising a pattern of alignment attributes with known deviations in the pattern encoded onto the reticle wherein the known deviations are imaged in predetermined locations on an exposed recording media and appear in a predetermined order when the projection system is operated in accordance with an ordered job deck, wherein location of the deviations within the pattern determine if the job deck is in a proper

order." The dependent claims incorporate these limitations and likewise are patentable over the cited references.

These limitations are not shown by the cited patents. For example, Bareket describes a "mark for use in measuring the relative position between a first and a second layer of a device." (See Claim 1 of Bareket). To make these measurements, Bareket describes a "periodic structure in the form of alignment pattern 10." (See Col. 3, lines 49-50 and Figure 2 of Bareket). Bareket goes on to describe how the "registration error between two layers of the film stack is directly proportional to the misalignment between the portions of the grating pattern on each of the consecutive layers of the wafer 100 in the direction in which the measurement was made." (See Col. 6, lines 34-38 of Bareket). Thus, Bareket describes measurement of registration error using a periodic structure alignment pattern.

In contrast to Bareket's periodic alignment pattern, Claim 1 of the pending application recites "a pattern of alignment attributes with known deviations in the pattern encoded onto the reticle wherein the known deviations are imaged in predetermined locations on an exposed recording media and appear in a predetermined order when the projection system is operated in accordance with a properly ordered job deck, the deviations include placement errors in the pattern of alignment attributes, wherein the placement errors include a removed portion of an attribute, located at the same position of the pattern of alignment attributes, inside each field point array." Thus, the pattern of alignment attributes recited in Claim 1 includes known deviations that have placement

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errors, unlike the pattern of alignment attributes in Bareket. In addition, if there were deviations in Bareket's alignment pattern, it would make Bareket inoperable because the deviations would result in misalignment between portions of the grating on consecutive layers of the wafer and would result in errors in the measurements made by Bareket. That is, deviations in Bareket's pattern make his system inoperable. The limitations of Claim 35 and Claim 43 are similarly distinguished from Bareket.

Like Bareket, the patents to Sogawa, Huang, Nara, and Hiruma all describe measuring registration errors using patterns of alignment attributes that do not have known deviations. For example, Sogawa describes a target used for precision measurement that includes forming a first box on a substrate and then forming a second "top" box, of a similar shape as the first box, that is rotated 45° with respect to the first box such that the centers of the two boxes coincide. Measurements are made between the two boxes for precise positional determination. (See Claim 1 and Figure 3 of Sogawa). Sogawa does not describe deviations in the pattern formed by the two boxes and, like Bareket, deviations in the pattern would make Sogawa inoperable because it would result in errors, thereby affecting the precision of the measurement.

Similarly, Huang describes a technique for aligning a mask in a photolithographic process using a plurality of alignment patterns that are perpendicular to each other. (See Claim 1 and Figure 1 of Huang). Huang does not describe known deviations in an alignment pattern, and deviations in Huang's alignment pattern would result in errors in aligning a mask. Nara describes an alignment technique using an alignment mark that

includes a plurality of element marks, where each mark is a different shape, and detecting any one element to determine the position of the mark. (See Claim 1 and Figures 2-4 of Nara). Nara does not describe known deviations in the alignment pattern. Deviations in the alignment pattern would result in errors in Nara's alignment, thereby making Nara inoperable. Hiruma describes marks that are used to detect misregistration in a photolithographic system. Because Hiruma is using the marks to determine misregistration, deviations in the alignment attributes would result in errors, thereby making Hiruma inoperable. Therefore, Huang, Nara, and Hiruma, like Bareket and Sogawa, each describe alignment patterns that do not include known deviations, and in any case, if there were deviations, then each would be inoperable due to errors caused by the deviations.

Thus, no proposed or possible combination of the cited references would provide the reticle recited in the claims. Therefore, it is asserted that the pending claims are not anticipated by, nor rendered obvious by, the cited references.

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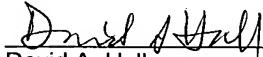
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In view of the amendments and above remarks, an allowance of Claims 1, 5-17 and Claims 35-55 is respectfully requested.

Respectfully submitted,
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